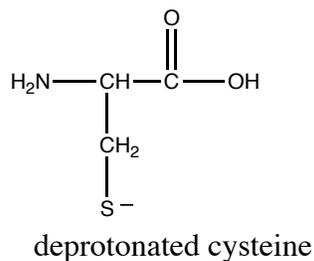
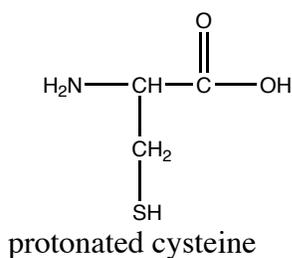


LECTURE 27

1. Zinc can act as a Lewis acid and coordinate amino acids like cysteine by their sulfhydryl (SH) groups. Normally, the sulfhydryl group of cysteine has a pK_a of ~ 8 . However, the interaction with zinc can lower the pK_a of the sulfhydryl group by as much as 4 pH units. Recalling your knowledge of acid/base chemistry, **estimate** the approximate ratio of protonated to deprotonated cysteine at neutral pH for (a) free cysteine (pK_a of ~ 8) and (b) cysteine coordinated to zinc (pK_a of ~ 4). (Since this is an estimate, don't worry about sig figs).



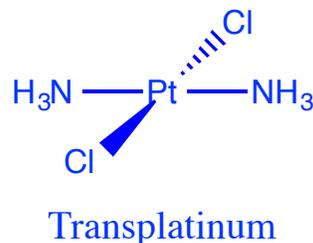
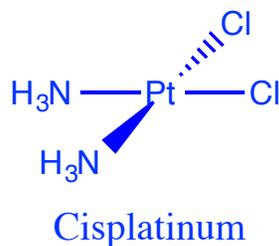
- (a) **10 times as much protonated cysteine as there is deprotonated cysteine**
(b) **1000 times as much deprotonated cysteine as there is protonated cysteine**

2. For $[\text{CoCl}_6]^{3-}$,
(a) Determine the coordination number of the cobalt.
(b) Determine the oxidation number of the cobalt.

- (a) **The coordination number of the cobalt is 6.**
(b) **the oxidation number on the cobalt is +3.**

3. Cisplatin $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ is a potent anticancer drug.
(a) Draw the structure of this square planar molecule and the structure of its isomer transplatinum
(b) State the expected angles for a square planar molecule
(c) Determine the CN

a)



- b) **90°**
c) **4**

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